

Remarks/Arguments

I. Status of the Claims

In the non-final Office Action, the Examiner indicated that claims 1-18, 35 and 36 are pending and rejected claims 1-18, 35 and 36 under 35 U.S.C. §103(a).

Claims 19-34 and 37-39 were previously canceled in light of a restriction requirement.

In this Amendment, claims 2 and 36 are canceled and new claims 40-42 are added.

Claims 1, 3-18, 35 and 40-42 are pending for reconsideration.

II. Statement of Summary of Interview

The Applicants appreciate the courtesy extended by Examiner Ahmed in granting an interview on February 2, 2005 and February 3, 2005. The Examiner's Interview Summary attached to the non-final Office Action is complete and accurate.

III. Discussion of Amendments to the Claims and the New Claims

During the preparation of this Amendment, the Applicants discovered that the Response to Restriction Requirement filed January 26, 2004 inadvertently introduced undelineated changes in the text of certain claims (i.e., claims 1, 11, 12 and 35). More particularly, the undelineated changes related to the etchant, i.e., the referenced claims in the Response to the Restriction Requirement refer to a "metal etchant", whereas those

same claims in the originally filed patent application merely refer to an “etchant”. This Amendment treats the changes made in the Response to the Restriction Requirement as controlling.

Independent claim 1 is amended to incorporate the subject matter of dependent claim 2 (now canceled). Claim 1 now requires the substrate to be a disk substrate for use in a data storage device.

Independent claim 35 is amended to incorporate the subject matter of both dependent claims 2 and 36 (each of which is now canceled). Claim 35 now requires the colloidal particles have a specified nominal size to provide a textured surface on a disk substrate for use in a data storage device.

Dependent claim 3 is amended to depend from claim 1 rather than claim 2 (now canceled).

Dependent claims 11 and 12 are amended to correct informalities.

New dependent claim 40 requires the surfactant to be an ethylene oxide propylene oxide block copolymer. A basis for this amendment may be found at, for example, page 22, line 20 and page 23, line 22 of the patent application. The cited art does not disclose or suggest using an ethylene oxide propylene oxide block copolymer as the surfactant.

New independent claim 41 requires the surfactant to be precipitated on a surface of the substrate and/or colloidal particles. A basis for this amendment may be found at, for example, page 22, line 24 - page 23, line 2 of the patent application. The cited art does not disclose or suggest precipitating the surfactant.

New dependent claim 42 requires the precipitated surfactant to be sodium octyl sulfate. A basis for this amendment may be found at, for example, page 22, line 25 of the patent application. The cited art does not disclose or suggest using sodium octyl sulfate as the precipitated surfactant.

IV. Objection to Claims 11 and 12

At page 2, item 2 of the non-final Office Action, claims 11 and 12 are objected to because of informalities. Claims 11 and 12 are amended herein to positively recite that the metal etchant is an ion and thereby correct the informalities noted by the Examiner.

Therefore, the Applicants respectfully request reconsideration and withdrawal of the objection to claims 11 and 12.

V. Rejection of Claims 1, 4-10, 13-18, 35 and 36 under 35 U.S.C. §103(a)

At pages 3-4, item 5 of the non-final Office Action, claims 1, 4-10, 13-18, 35 and 36 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ma et al. (U.S. Patent Application Publication US 2003/0079416 A1).

This rejection is moot because independent claims 1 and 35 are amended herein to include the subject matter of claim 2 (now canceled). Claims 1 and 35 now require the substrate to be a disk substrate for use in a data storage device. The Ma et al. reference fails to disclose or suggest using its chemical mechanical polishing slurry composition and method in the context of superfinishing a surface of a disk substrate for use in a data storage device (claim 1) or finishing to provide a textured surface of a disk substrate for use in a data storage device (claim 35).

Claims 4-10 and 13-18 depend from claim 1, and thus define over the Ma et al. reference for the same reason discussed above with respect to claim 1. Claim 36 is canceled herein, its subject matter having been incorporated into claim 35.

Therefore, the Applicants respectfully request reconsideration and withdrawal of this rejection of still pending claims 1, 4-10, 13-18 and 35 under §103(a).

VI. Rejections of Claims 1-18, 35 and 36 under 35 U.S.C. §103(a)

At pages 4-5, item 6 of the non-final Office Action, claims 1-6, 8-18, 35 and 36 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hartog et al. (U.S. Patent No. 6,236,542) in view of Kramer et al. (U.S. Patent No. 6,630,403).

At page 6, item 7 of the non-final Office Action, claims 7 and 8 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hartog et al. (U.S. Patent No. 6,236,542) in view of Kramer et al. (U.S. Patent No. 6,630,403) and further in view of Small et al. (U.S. Patent No. 6,251,150).

These rejections are respectfully traversed to the extent that they are maintained. As discussed below, there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the primary reference to Hartog et al. or to combine the reference teachings as suggested by the Examiner. Moreover, as discussed below, there was no reasonable expectation of success in modifying the primary reference to Hartog et al. or combining the reference teachings as suggested by the Examiner.

The Hartog et al. patent fails to disclose or suggest a self-cleaning colloidal slurry composition having “a surfactant adsorbed and/or precipitated onto a surface of at least one of the substrate and the colloidal particles, the surfactant having a hydrophobic section that forms a steric hindrance barrier between the substrate and the colloidal particles” as recited in each of the independent claims, i.e., claims 1 and 35. That is, the Hartog et al patent does not disclose or suggest including a surfactant in the colloidal

slurry composition that forms a steric hindrance barrier between the colloidal particles and substrate surface.

In the non-final Office Action, the Examiner admits to this deficiency in the primary reference to Hartog et al. stating, "Hartog et al fail to teach the composition comprises a surfactant that forms a steric hindrance barrier between the substrate and the colloidal particles." In the non-final Office Action, the Examiner indicates that this deficiency in the primary reference to Hartog et al. is cured by the secondary reference to Kramer et al. However, the Applicants respectfully disagree.

There is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the primary reference to Hartog et al. or to combine the reference teachings as suggested by the Examiner. The teachings of the Kramer et al. patent referred to by the Examiner are in the context of a reduction of surface roughness of semiconductor wafers in the manufacturing of integrated circuits and other electronic devices. See, Kramer et al., col. 1, lines 14-18 and col. 1, lines 21-28. The teachings of the Kramer et al. reference are not in the context of superfinishing a surface of a disk substrate for use in a data storage device (claim 1) or finishing to provide a textured surface of a disk substrate for use in a data storage device (claim 35). It would not have been obvious to one of ordinary skill in the art to apply teachings of the Kramer et al. patent relating to the superfinishing polish slurry described in the Hartog et al. patent.

In the non-final Office Action, the Examiner states, "However, Kramer et al disclose a polishing composition including silica abrasive and surfactant, wherein the surfactant forming particle barrier layer or flow modifiers to reduce roughening on the polished surface in order to reduce scratches and eventually cracking on the polished

surface and the reduction of cracking decreases access of cleaning chemistry to underlying structures of the substrate (col.2, lines 1-5 and lines 53-57 and col. 3, lines 13-21 and col. 4, line 66 - col. 5, line 12 and col. 6, lines 55-67).” See, non-final Office Action, page 4, line 17 - page 5, line 2. However, the Kramer et al. patent’s teachings are in the context of overcoming a “wormholing” problem that is not presented in the processing of disk substrates. See, Kramer et al., col. 1, line 57 - col. 2, line 9. According to the Kramer et al. patent, “wormholing” can provide channeling of subsequent cleaning chemistries, such as Tetra Methyl Ammonia Hydroxide (TMAH), to underlying metal structures, thus creating metal voids in the integrated circuit. In contrast to semiconductor wafers, disk substrates have no such underlying integrated circuit metal structures in which metal voids may be undesirably formed through “wormholing”. It would not have been obvious to one of ordinary skill in the art to apply teachings of the Kramer et al. patent relating to overcoming the problem of “wormholing” in processing semiconductor wafers to the superfinishing polish slurry described in the Hartog et al. patent for processing disk substrates where “wormholing” is not a problem.

Moreover, independent claim 35 is amended herein to require that the colloidal particles have a specified nominal size to provide a textured surface on a disk substrate for use in a data storage device. Texturing is not taught in either the Hartog et al. patent or the Kramer et al. patent. Although the specified nominal size of the colloidal particles (i.e., 70-200 nm) set forth in claim 35 is included in the broad colloidal particle size (i.e., 1-1000 nm) teaching of the Hartog et al. patent, the broad colloidal particle teaching of the Hartog et al. patent is in the context of superfinishing -- not texturing. The teachings of the Kramer et al. patent, which relate to reduction of surface roughness, would lead one of ordinary skill in the art away from providing a textured surface on a disk substrate.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must be found in the prior art, not applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). The Applicants respectfully submit that the teaching or suggestion to make the claimed combination and the reasonable expectation of success are based on impermissible hindsight gleaned from the applicant's disclosure, not the prior art. It is improper to use the inventor's patent application as an instruction book on how to reconstruct the prior art. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1 USPQ2d 1593 (Fed. Cir. 1987).

The secondary reference to Small et al. is cited for allegedly teaching "a composition comprises colloidal particles of silica or alumina (aluminum oxide) having a pH of about 3.8 - 9.4 for maintaining the zeta potential of the slurry composition in order clean or remove the residue efficiently (col. 10, lines 8-15, col. 10, lines 48-51 and col. 11, lines 4-7)." However, the secondary reference to Small et al. does not cure the deficiency in the primary reference to Hartog et al. relative to a surfactant having a hydrophobic section that forms a steric hindrance barrier between the substrate and the colloidal particles.

Claims 3-18 depend, directly or indirectly, from independent claim 1, and set forth all of the limitations therein plus additional limitations that are not disclosed or suggested by the cited art. For example, claim 7 requires the surfactant to be a quaternary amine surfactant. The cited art, including the Kramer et al. patent, fails to disclose or suggest a quaternary amine surfactant. Claim 14 requires the surfactant to be selected from a group consisting of alkaloids and amines, and combinations thereof. The cited art, including the Kramer et al. patent, fails to disclose or suggest a surfactant that is selected from a group consisting of alkaloids and amines, and combinations thereof. Claim 15 requires the surfactant to be selected from a group consisting of alkaloids and amines, and

combinations thereof. The cited art, including the Kramer et al. patent, fails to disclose or suggest a surfactant that is selected from a group consisting of alkaloids and amines, and combinations thereof. By such additional limitations, and for the reasons discussed above with respect to independent claim 1, the Applicants respectfully submit that dependent claims 3-18 also patentably define over the prior art.

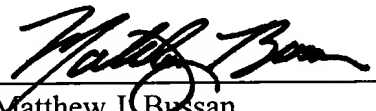
Therefore, the Applicants respectfully request reconsideration and withdrawal of these rejections of still pending claims 1, 3-18 and 35 under §103(a).

VII. Conclusion

In view of the foregoing comments, the Applicants respectfully submit that all of the pending claims (i.e., claims 1-18, 35 and 40-42) are in condition for allowance and that the application should be passed to issue.

If a conference would be of value in expediting the prosecution of this application, the Examiner is hereby encouraged to telephone the undersigned counsel at (847) 462-1937 to arrange for such a conference.

Respectfully submitted,

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